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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/797,053	03/11/2004	Keiichi Kuramoto	MAM-039	4691

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EXAMINER

CHIEM, DINH D

ART UNIT PAPER NUMBER

2883

DATE MAILED: 11/03/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/797,053

Applicant(s)

KURAMOTO ET AL.

Examiner

Erin D. Chiem

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
  - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
  - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 25 July 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) 9, 11, 12, 17-20, 22-24 and 26 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8, 10, 13-16, 21 and 25 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

This office action is in response to the amendment filed on July 25, 2006. Claims 1-26 are pending.

### *Claim Objections*

In view of the amendment, the objection to claims 1 and 21 is withdrawn.

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

Claims 1-2, 5-6, 10, 14-16, and 21 are rejected under 35 U.S.C. 102(b) as being anticipated by Shimoda (JP 2004-046282).

Shimoda discloses a lower clad layer (2) formed on a substrate (1); a core layer which forms an optical transmission region provided on the lower clad layer (3), an upper clad layer provided on and surrounding the core layer (4), a stress moderating layer provided in at least one portion between the upper clad layer and the lower clad layer for moderating stress caused by shrinkage of the upper clad layer when formed (5). Shimoda teaches the stress moderating layer, core layer and/or lower clad layer is formed from an organic-inorganic composite (Para [0028]).

*Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shimoda in view of Matsuno et al. (JP 2003-248130 A)

Shimoda discloses a lower clad layer (2) formed on a substrate (1); a core layer which forms an optical transmission region provided on the lower clad layer (3), an upper clad layer provided on and surrounding the core layer (4), a stress moderating layer provided in at least one portion between the upper clad layer and the lower clad layer for moderating stress caused by shrinkage of the upper clad layer when formed (5). Shimoda teaches the stress moderating layer, core layer and/or lower clad layer is formed from an organic-inorganic composite (Para [0028]).

However, Shimoda does not disclose the storage modulus of the stress-moderating layer is less than that of the upper clad layer. The examiner respectfully points out that applicant's lexicographic recitation of "the storage modulus" is more commonly known as "Young's modulus" or "bulk modulus" all referring to the stress characteristic of the material within the optical waveguide structure.

Matsuno teaches the Young's modulus of the interface layer is smaller than the Young's modulus of optical waveguide layer and board (See NOVELTY section).

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Since Shimoda and Matsuno are from the same field of endeavor, the purpose disclosed by Matsuno would have been recognized in the pertinent art of Shimoda.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to recognize the concept of making the interface layer Young's modulus smaller than that of optical waveguide due to thermal expansion coefficient difference of optical waveguide layer and board is suppressed. The motivation for providing such interface layer is to fully control the birefringence of the optical structure. The instance layer is very thin thus susceptible to the slightest stress caused by thermal expansion. The slightest stress will cause warping of the layer such that the birefringence is affected.

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shimoda and Matsuno as applied to claim 3 above, and further in view of Gao et al. (US 6,917,749).

Shimoda and Matsuno disclose all the limitations of claim 1 and 3.

However, Shimoda and Matsuno do not disclose the optimum storage modulus stress range of 100,000 kgf/cm<sup>2</sup> or lower at 30 degree Celsius.

Gao's generalized Equation 1 will satisfy limitation of claim 4 if given the other known variables that applicants does not provide in the claim.

Since Shimoda, Matsuno and Gao are all from the same field of endeavor, the purpose disclosed by Gao would have been recognized in the pertinent art of Shimoda and Matsuno.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to recognize Equation 1 disclosed by Gao is a common tool used among designer when the thermal expansion and Young's modulus of a material layer within the

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waveguide is contemplated. **The motivation** utilizing the mathematical tool as disclosed by Gao is to provide a better design when the stress of the buffer layer has been contemplated rather than performing multiple test trials that would be less efficient and not cost effective. Furthermore, it has been found that “the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation.” *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955).

Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shimoda in view of Ohashi et al. (US Application 2005/0265685).

Shimoda discloses a lower clad layer (2) formed on a substrate (1); a core layer which forms an optical transmission region provided on the lower clad layer (3), an upper clad layer provided on and surrounding the core layer (4), a stress moderating layer provided in at least one portion between the upper clad layer and the lower clad layer for moderating stress caused by shrinkage of the upper clad layer when formed (5). Shimoda teaches the stress moderating layer, core layer and/or lower clad layer is formed from an organic-inorganic composite (Para [0028]).

However, Shimoda does not disclose the organic-inorganic composite is produced from an organic polymer and a metal alkoxide.

Ohashi discloses a waveguide is made from an organic-inorganic composite is produced from an organic polymer and a metal alkoxide (see paragraph [0239]).

Since Shimoda and Ohashi are from the same field of endeavor, the purpose disclosed by Ohashi would have been recognized in the pertinent art of Shimoda.

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It would have been obvious at the time the invention was made to a person having ordinary skill in the art to utilize an organic polymer and a metal alkoxide as the organic-inorganic composite in the process of manufacturing the optical waveguide since these compounds are known in the art. **The motivation** using organic polymer and metal alkoxide as waveguide composites is to increase durability because such composite resist moisture and heat, thus sustaining the waveguide in a longer operable condition.

Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shimoda.

Shimoda discloses the invention of claim 1 and further teaches that the stress prevention layer thickness is correlated to the core such that the stress prevention layer cannot be too thin or too thick and preferably about 0.2-5 micrometers.

However, Shimoda does not express the thickness of the stress prevention layer in terms of the core thickness as claimed.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to recognize the thickness of the stress prevention layer is correlated to the core such that if too thin will sink to the supporting substrate and if too thick the stress prevention layer will not function as a stress prevention layer. It has been held that discovering an optimum value of a result effective variable involves only routine skill in the art *In re Boesch*, 617 F.2d 272, 205 USPQ 215.

Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shimoda in view

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Shimoda discloses the invention of claim 1; however, Shimoda does not disclose the corners of the core layer are rounded. The rounded corners commonly occur as the result of the etching process.

***Response to Arguments***

Applicant's arguments with respect to claims 1-8, 10, 13-16, and 21-25 have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Erin D. Chiem whose telephone number is (571) 272-3102. The examiner can normally be reached on Monday - Thursday 9AM - 5PM.



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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank G. Font can be reached on (571) 272-2415. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Erin D Chiem  
Examiner  
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